

**APPLICATION**

**FOR UNITED STATES LETTERS PATENT**

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**SPECIFICATION**

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, **Rodney Long**, a citizen of the United States, have  
invented a new and useful conveyor belt alignment system of which the following is a  
specification:

1  
2  
3 **Conveyor Belt Alignment System**  
4  
5

6 **CROSS REFERENCE TO RELATED APPLICATIONS**

7 Not applicable to this application.  
8  
9

10 **STATEMENT REGARDING FEDERALLY**  
11 **SPONSORED RESEARCH OR DEVELOPMENT**

12 Not applicable to this application.  
13  
14

15 **BACKGROUND OF THE INVENTION**  
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17  
18

19 **Field of the Invention**  
20

21 The present invention relates generally to conveyor belt support devices and  
22 more specifically it relates to a conveyor belt alignment system for maintaining a  
23 maintaining a conveyor belt's alignment under various operating conditions.  
24  
25

26 **Description of the Related Art**  
27

28 Conveyors are utilized in various types of equipment and industries to transfer  
29 particulate material. Conveyor belts on conveyors need to be aligned along a

1 longitudinal axis to avoid unnecessary wear and tear. Conventional conveyors have  
2 rollers supporting the lower side of the conveyor belt, but little support is provided to  
3 the side-to-side movement of the conveyor. One attempted solution is “training idlers”  
4 but they do not provide the desired control of a conveyor belt.

5  
6 While these devices may be suitable for the particular purpose to which they  
7 address, they are not as suitable for maintaining a maintaining a conveyor belt’s  
8 alignment under various operating conditions. Conventional conveyors do not provide  
9 adequate belt alignment functionality.

10  
11 In these respects, the conveyor belt alignment system according to the present  
12 invention substantially departs from the conventional concepts and designs of the prior  
13 art, and in so doing provides an apparatus primarily developed for the purpose of  
14 maintaining a maintaining a conveyor belt’s alignment under various operating conditions.

1

2                   **BRIEF SUMMARY OF THE INVENTION**

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4           In view of the foregoing disadvantages inherent in the known types of  
5 conveyors now present in the prior art, the present invention provides a new conveyor  
6 belt alignment system construction wherein the same can be utilized for maintaining a  
7 maintaining a conveyor belt's alignment under various operating conditions.

8

9           The general purpose of the present invention, which will be described  
10 subsequently in greater detail, is to provide a new conveyor belt alignment system that  
11 has many of the advantages of the conveyors mentioned heretofore and many novel  
12 features that result in a new conveyor belt alignment system which is not anticipated,  
13 rendered obvious, suggested, or even implied by any of the prior art conveyors, either  
14 alone or in any combination thereof.

15

16           To attain this, the present invention generally comprises a mounting plate for  
17 attaching to a structure, a first plate attached to a second plate, wherein the second  
18 plate is adjustably attached to the mounting plate, a support frame adjustably  
19 positioned upon the first plate, a plurality of first idlers extending from the support  
20 frame, and a plurality of second idlers extending from the support frame. The first  
21 idlers are positioned on opposite surfaces of the conveyor belt for vertical alignment.  
22 The second idlers are positioned on the same side of the conveyor belt for horizontal  
23 alignment.

24

25           There has thus been outlined, rather broadly, the more important features of the  
26 invention in order that the detailed description thereof may be better understood, and  
27 in order that the present contribution to the art may be better appreciated. There are  
28 additional features of the invention that will be described hereinafter and that will form  
29 the subject matter of the claims appended hereto.

1  
2       In this respect, before explaining at least one embodiment of the invention in  
3 detail, it is to be understood that the invention is not limited in its application to the  
4 details of construction and to the arrangements of the components set forth in the  
5 following description or illustrated in the drawings. The invention is capable of other  
6 embodiments and of being practiced and carried out in various ways. Also, it is to be  
7 understood that the phraseology and terminology employed herein are for the purpose  
8 of the description and should not be regarded as limiting.

9  
10       A primary object of the present invention is to provide a conveyor belt  
11 alignment system that will overcome the shortcomings of the prior art devices.

12  
13       A second object is to provide a conveyor belt alignment system for maintaining  
14 a maintaining a conveyor belt's alignment under various operating conditions.

15  
16       Another object is to provide a conveyor belt alignment system that may be  
17 utilized upon various types of conveyors and conveyor belts.

18  
19       An additional object is to provide a conveyor belt alignment system that is  
20 adjustable.

21  
22       A further object is to provide a conveyor belt alignment system that assists in  
23 extending the useful life of a conveyor belt.

24  
25       Another object is to provide a conveyor belt alignment system that reduces the  
26 side-to-side movement of a conveyor belt.

1           Other objects and advantages of the present invention will become obvious to the  
2 reader and it is intended that these objects and advantages are within the scope of the  
3 present invention.

4  
5           To the accomplishment of the above and related objects, this invention may be  
6 embodied in the form illustrated in the accompanying drawings, attention being called  
7 to the fact, however, that the drawings are illustrative only, and that changes may be  
8 made in the specific construction illustrated and described within the scope of the  
9 appended claims.

1  
2                   **BRIEF DESCRIPTION OF THE DRAWINGS**  
3

4           Various other objects, features and attendant advantages of the present  
5 invention will become fully appreciated as the same becomes better understood when  
6 considered in conjunction with the accompanying drawings, in which like reference  
7 characters designate the same or similar parts throughout the several views, and  
8 wherein:  
9

10           FIG. 1 is an upper perspective view of the present invention.  
11

12           FIG. 2 is an upper perspective view of the present invention with the idlers  
13 lowered and extended.  
14

15           FIG. 3 is an end view of the present invention.  
16

17           FIG. 4 is a side view of the present invention.  
18

19           FIG. 5 is a top view of the present invention.  
20

21           FIG. 6 is a top view of the present invention in a released position with respect  
22 to a conveyor belt.  
23

24           FIG. 7 is a top view of the present invention in a engaged position with respect  
25 to a conveyor belt.  
26

27           FIG. 8 is a top view of the present invention positioned on opposing sides of  
28 the conveyor belt.  
29

FIG. 9 is an upper perspective view of the present invention aligning a conveyor belt.

FIG. 10 is an upper perspective view of an alternative embodiment of the present invention.



## DETAILED DESCRIPTION OF THE INVENTION

### *A. Overview*

Turning now descriptively to the drawings, in which similar reference characters denote similar elements throughout the several views, FIGS. 1 through 10 illustrate a conveyor belt alignmet system **10**, which comprises a mounting plate **40** for attaching to a structure, a first plate **20** attached to a second plate **30**, wherein the second plate **30** is adjustably attached to the mounting plate **40**, a support frame **50** adjustably positioned upon the first plate **20**, a plurality of first idlers **60** extending from the support frame **50**, and a plurality of second idlers **70** extending from the support frame **50**. The first idlers **60** are positioned on opposite surfaces of the conveyor belt **12** for vertical alignment. The second idlers **70** are positioned on the same side of the conveyor belt **12** for horizontal alignment. Figure 8 illustrates that utilizing a pair of the present inventions on opposing sides of the conveyor belt **12** is desirable.

### *B. Mounting Plate*

A mounting plate **40** is provided for attaching to a structure (e.g. frame of conveyor, external structure). The mounting plate **40** may have a plurality of apertures for receiving a plurality of fasteners such as shown in Figure 2 of the drawings. The mounting plate **40** may be attached to the structure utilizing various other conventional fastening methods and structures.

### *C. Adjustment Structure*

An adjustment structure is adjustably attached to the mounting plate **40**. The adjustment structure is comprised of a first plate **20** attached to a second plate **30** forming an L-shaped structure. It can be appreciated that other shapes may be formed for the adjustment structure other than illustrated in the drawings.

1  
2       The second plate **30** is adjustably attached to the mounting plate **40** in a vertical  
3 manner as illustrated in Figure 2 of the drawings. The second plate **30** has at least one  
4 second slot **32** for receiving fasteners extending through the mounting plate **40** as  
5 shown in Figure 2 of the drawings. The user is able to secure the vertical position of  
6 the second plate **30** by tightening the fasteners. It can be appreciated that other types  
7 of securing methods and systems may be utilized to adjustably secure the second plate  
8 **30** to the mounting plate **40**.

9  
10       The first plate **20** has at least one first slot **22** for receiving fasteners extending  
11 through the support frame **50** as shown in Figures 1 and 2 of the drawings. The first  
12 slot **22** may be transversely orientated with respect to the second slot **32** as shown in  
13 Figure 2 of the drawings.

#### 14 15 **D.     *Support Frame***

16       The support frame **50** is adjustably positioned upon the adjustment structure as  
17 shown in Figure 2 of the drawings. More particularly, the support frame **50** is  
18 adjustably attached to the first plate **20** in a horizontal manner. The support frame **50**  
19 may be moved horizontally closer or away with respect to an edge of the conveyor belt  
20 **12**. Fasteners or other securing structures may be utilized to secure the support frame  
21 **50** to the first plate **20**.

#### 22 23 **E.     *Idlers***

24       A plurality of first idlers **60** rotatably extend from the support frame **50** in a  
25 parallel manner with respect to one another as shown in Figure 4 of the drawings. A  
26 plurality of second idlers **70** extend from the support frame **50** in a parallel manner  
27 with respect to one another as shown in Figure 3 of the drawings. The second idlers **70**  
28 may be substantially transverse with respect to the first idlers **60** as shown in Figure 4  
29 of the drawings.

1  
2       The first idlers **60** are positionable on opposite surfaces (top and bottom) of a  
3 conveyor belt **12** for vertical alignment of a conveyor belt **12** as shown in Figure 4 of  
4 the drawings. The second idlers **70** are positionable on a same side of a conveyor belt  
5 **12** for horizontal alignment of a conveyor belt **12** as shown in Figures 4 and 7 of the  
6 drawings.

7  
8   ***F.     Alternative Embodiment***

9       Figure **10** illustrates an alternative embodiment of the present invention where  
10 increased numbers of first idlers **60** and second idlers **70** are utilized. It can be  
11 appreciated that various other numbers of idlers **60**, **70** may be utilized.

12  
13   ***G.     Operation of Invention***

14       The user attaches the mounting plate **40** to the frame of the conveyor or an  
15 adjacent structure. The user then adjusts the vertical position of the second plate **30** to  
16 a desired vertical height so that the conveyor belt **12** is properly positioned between the  
17 first idlers **60** as illustrated in Figures 4 and 9 of the drawings.

18  
19       The user then adjusts the horizontal position of the first plate **20** to a desired  
20 position so that the second idlers **70** are positioned near or adjacent to an edge of the  
21 conveyor belt **12** as shown in Figures 7 and 8 of the drawings. The above process may  
22 be repeated on the opposite side of the conveyor belt **12**.

23  
24       As to a further discussion of the manner of usage and operation of the present  
25 invention, the same should be apparent from the above description. Accordingly, no  
26 further discussion relating to the manner of usage and operation will be provided.

27  
28       With respect to the above description then, it is to be realized that the optimum  
29 dimensional relationships for the parts of the invention, to include variations in size,

1 materials, shape, form, function and manner of operation, assembly and use, are  
2 deemed to be within the expertise of those skilled in the art, and all equivalent  
3 structural variations and relationships to those illustrated in the drawings and  
4 described in the specification are intended to be encompassed by the present invention.

5  
6 Therefore, the foregoing is considered as illustrative only of the principles of  
7 the invention. Further, since numerous modifications and changes will readily occur to  
8 those skilled in the art, it is not desired to limit the invention to the exact construction  
9 and operation shown and described, and accordingly, all suitable modifications and  
10 equivalents may be resorted to, falling within the scope of the invention.